

Leveraging MSLQ Data for Predicting Student Achievement Goal Orientations

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ABSTRACT: This study aims to investigate how the learning strategies and achievement goal orientations of students relate to their academic behaviours and performance in the context of an online learning system. The study also develops and validates a relational model between student learning strategies and achievement goals.

KEYWORDS: Online learning, motivation, learning strategies, achievement goals

1 INTRODUCTION

Collaborative online learning environments such as MOOCs have created new roles and responsibilities for both teacher and learner where the onus of learning is shifting towards learners, and the teacher acts more like a facilitator. These shifted roles have created new motivational (e.g., intrinsic motivation, anxiety), cognitive (e.g., self-regulation, resource management), and performance challenges for learners (Visser, Plomp, Amirault, & Kuiper, 2002; Kim, 2009; Macfadyen & Dawson, 2010).

Motivation and cognition form the broad domain of learner characteristics that influence study behaviour and performance (Credé & Phillips, 2011; Jakesova & Hrbáckova, 2014). Achievement goals theory (Pintrich, 2000) has been one of the more generative areas of research on motivation and self-regulated learning (SRL) for over two decades. Learning motivation and achievement goals influence learner behaviour and performance in classroom settings. Our research question aims to find how learning motivation and achievement goals relate to a student's study logged activities in online collaborative environments such as MOOCs. The ability to predict students' goal orientations from their online activities will support user-level course adaptations and early interventions to support learning. We used the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich & DeGroot, 1990) and the Achievement Goal Orientations (AGO) instruments for gauging students' self-reported learning strategies and goal orientations. Both instruments are highly reliable and have been in use for over a decade, generating huge datasets worldwide.

Past research (e.g., Bandura, 1986; Credé & Phillips, 2011; Phan, 2012) has shown that various motivational constructs in MSLQ, such as self-efficacy, correlate with AGO constructs (e.g., Phan, 2012), such as mastery goal orientation. These findings guide our second research question: can we predict students' achievement goal orientation from their self-reported learning strategies? A positive answer to this question would allow researchers to use the same MSLQ datasets to draw student goal orientations and learning motivations, equipping them with added information to interpret student online learning behaviours.

2 BACKGROUND

MSLQ is a self-reporting instrument for predicting the academic performance of college students. It measures student motivation, self-regulation, and learning strategies. Development of MSLQ was based on the integration of motivational and cognitive theories of learning (McKeachie, Pintrich, Lin, & Smith, 1987; Pintrich & De Groot, 1990). MSLQ adapted Atkinson's expectancy-value theory of motivation for conceptualizing motivation (Pintrich & De Groot, 1990). The conceptualizations of learning strategies were based on cognitive and social cognitive approaches of teaching and learning (McKeachie, Pintrich, Lin, & Smith, 1987). The achievement goal theory of motivation has been a prominent area of theoretical and empirical inquiry in educational psychology since the late 1970s and early 1980s, which evolved from the pioneering work of Dweck (1986), Nicholls (1984), and others. Central to the achievement goal theory were the concepts of achievement motivation and competence.

3 STUDY

A total of 376 undergraduate students took part in this preliminary study. Of 353 valid responses, 55.2% (n=194) were female and 44.8% (n=158) were male. Students' learning strategies were measured using the Motivated Strategies for Learning Questionnaire, which included 44 items on student motivation, cognitive and metacognitive strategy use, and self-regulation. We measured their goal orientations using a 3X2 Achievement Goal Orientation questionnaire. A second study was conducted with another 34 undergraduate students one semester later. We used this second dataset to validate our models from the first study. We also theorized four new scales from the MSLQ data to measure the mastery approach, mastery avoidance, performance approach, and performance avoidance goal orientations. Student activity data was collected from an online software engineering course. The data was analyzed using parametric linear models including correlations, canonical correlations analysis, and multiple regression analysis. We analyzed theorized scales using both confirmatory and exploratory data analysis approaches.

4 RESULTS

Our confirmatory analysis of the preliminary study suggested that the MSLQ datasets could reveal the following achievement goal orientations of students: mastery approach, mastery avoidance, and performance approach goal orientations (Figure 1).

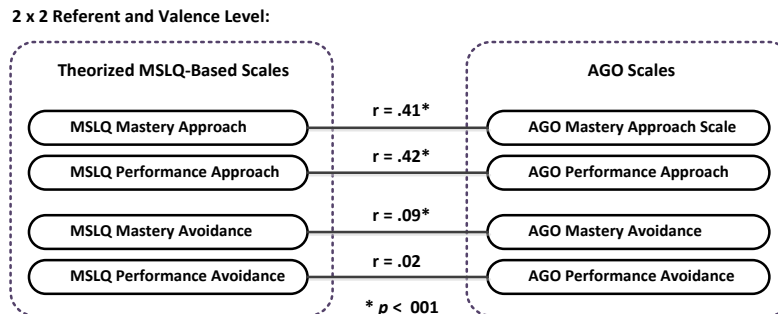


Figure 1. Correlation between theorized MSLQ and AGO scales.

5 CONCLUSION

The preliminary results provided empirical support for building new models to draw secondary information from the datasets collected for other primary purposes. The provision of secondary information can enhance our understanding of a phenomenon on one hand, and can allow for the reuse of precious datasets for additional purposes on the other.

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